

Claims

[c1] What is claimed is:

1. A CT system comprising:
a rotatable gantry having an opening for receiving a subject to be scanned;
an HF electromagnetic energy source configured to project a number of HF electromagnetic energy beams toward the subject;
a generator configured to energize the HF electromagnetic energy source to at least a first energy state and a second energy state; and
a number of HF electromagnetic energy filters positional between the HF electromagnetic energy source and the subject, the number of HF electromagnetic energy filters including at least a first filter and a second filter wherein the first filter is positioned between the HF electromagnetic energy source and the subject when the HF electromagnetic energy source is energized to the first energy state and the second filter is positioned between the HF electromagnetic energy source and the subject when the HF electromagnetic energy source is energized to the second energy state.
2. The CT system of claim 1 wherein the HF electromagnetic energy source and the number of HF electromagnetic energy filters are rotatable about the subject.
3. The CT system of claim 1 further comprising:
a set of HF electromagnetic energy detectors configured to generate a set of electrical signals indicative of HF electromagnetic energy attenuated by the subject;
a DAS configured to receive the set of electrical signals; and
an image reconstructor connected to the DAS and configured to reconstruct an image of the subject from the electrical signals received by the DAS.
4. The CT system of claim 1 further comprising a movable table configured to position the subject within the opening.
5. The CT system of claim 4 incorporated into a medical imaging device and wherein the subject is a medical patient.
6. The CT system of claim 4 wherein the movable table is configured to convey

articles through the opening wherein the articles include pieces of luggage/baggage and packages.

[c7] 7. The CT system of claim 6 incorporated into at least one of an airport inspection apparatus and a postal inspection apparatus.

[c8] 8. A controller configured to acquire CT imaging data at more than one chromatic energy state, the controller having instructions to: energize an HF electromagnetic energy source configured to project an HF electromagnetic energy beam toward a subject to be scanned to a first voltage potential; position a first portion of a filtering apparatus between the subject and the HF electromagnetic energy source along a path of rotation during energization of the HF electromagnetic energy source to the first voltage potential; energize the HF electromagnetic energy source to a second voltage potential; and position a second portion of the filtering apparatus between the subject and the HF electromagnetic energy source along the path of rotation during energization of the HF electromagnetic energy source to the second voltage potential.

[c9] 9. The controller of claim 8 having further instructions to energize the HF electromagnetic energy source such that a burst of HF electromagnetic energy is projected toward the subject.

[c10] 10. The controller of claim 8 wherein the filtering apparatus includes a single filter and wherein the first portion has a filtering power difference than a filtering power of the second portion.

[c11] 11. The controller of claim 8 wherein the filtering apparatus includes a first filter and a second filter, the controller having further instructions to: position the first filter between the subject and the HF electromagnetic energy source along the path of rotation during energization of the HF electromagnetic energy source to the first voltage potential; and position the second filter between the subject and the HF electromagnetic

energy source along the path of rotation during energization of the HF electromagnetic energy source to the second voltage potential.

[c12] 12. The controller of claim 11 having further instructions to:
position the first filter between the subject and a portion of the HF electromagnetic energy source along the path of rotation during energization of the HF electromagnetic energy source to the first voltage potential; and
position the second filter between the subject and the HF electromagnetic energy source along another path of rotation during energization of the HF electromagnetic energy source to the second voltage potential.

[c13] 13. The controller of claim 9 incorporated into a medical imaging apparatus configured to acquire medical diagnostic data of a medical patient.

[c14] 14. The controller of claim 9 incorporated into a non-invasive parcel inspection apparatus configured to non-invasively determine contents within a parcel.

[c15] 15. The controller of claim 14 wherein the non-invasive parcel inspection apparatus incorporated into at least one of a postal inspection system and an airport baggage inspection system.

[c16] 16. A method of acquiring imaging data at more than one chromatic energy comprising the steps of:
projecting a first beam of electromagnetic energy along a projection path toward a subject to be scanned;
positioning a first filter in the projection path during projection of the first beam;
projecting a second beam of electromagnetic energy along the projection path toward the subject; and
positioning a second filter in the projection path during projection of the second beam.

[c17] 17. The method of claim 16 further comprising the steps of:
energizing an HF electromagnetic energy source to a first voltage to generate the first beam of electromagnetic energy;
rotating the first filter along a path of rotation such that the first filter is in the

projection path during energization of the HF electromagnetic energy source to the first voltage;

energizing the HF electromagnetic source to a second voltage to generate the second beam of electromagnetic energy; and

rotating the second filter along the path of rotation such that the second filter is in the projection path during energization of the HF electromagnetic energy source to the second voltage.

[c18] 18. The method of claim 16 further comprising the step of acquiring imaging data with a first HF electromagnetic energy beam having a signal strength substantially equal to a signal strength of a second HF electromagnetic energy beam.

[c19] 19. A computer readable storage medium having a computer program stored thereon and representing a set of instructions that when executed by a computer causes the computer to:

energize an HF electromagnetic energy source to a first voltage to cause the HF electromagnetic energy source to project a first beam of electromagnetic energy toward a subject to be scanned;

position a first filter between the HF electromagnetic energy source and the subject during energization of the HF electromagnetic energy source to the first voltage;

energize the HF electromagnetic energy source to a second voltage to cause the HF electromagnetic energy source to project a second beam of electromagnetic energy toward the subject; and

position a second filter between the HF electromagnetic energy source and the subject during energization of the HF electromagnetic energy source to the second voltage.

[c20] 20. The computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to rotate the first filter and the second filter about the subject along a common path of rotation.

[c21] 21. The computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to rotate the first filter about the

subject along a first path of rotation and rotate the second filter about the subject along a second path of rotation.

- [c22] 22. The computer readable storage medium of claim 19 incorporated into a medical imaging apparatus configured to acquire diagnostic imaging data of a medical patient.
- [c23] 23. The computer readable storage medium of claim 19 incorporated into a non-invasive parcel inspection apparatus including at least one of a postal inspection apparatus and a baggage inspection apparatus.
- [c24] 24. A filtering apparatus for a radiation emitting imaging system, the filtering apparatus comprising:
 - a hub having a number of connection ports;
 - a first filter connected to the hub at a first connection port, the first filter having a first filtering power; and
 - a second filter connected to the hub at a second connection port, the second filter having a second filtering power.
- [c25] 25. The filtering apparatus of claim 24 wherein the first connection port is positioned 90° along the hub from the second connection port.
- [c26] 26. The filtering apparatus of claim 24 wherein the hub is configured to rotate the first filter into a path of HF electromagnetic energy when an HF electromagnetic energy source is energized to a first voltage and rotate the second filter into the path of HF energy when the HF electromagnetic energy projection source is energized to a second voltage.
- [c27] 27. The filtering apparatus of claim 24 further comprising a third filter connected to the hub at a third connection port and a fourth filter connected to the hub at a fourth connection port, the third and the fourth filters having differing filtering powers and the third connection port being positioned 90° along the hub from the fourth connection port.